

What is claimed is:

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1. An isolated nucleic acid encoding a feline CD80 ligand or a feline soluble CD80 ligand.
  2. An isolated nucleic acid encoding a feline CD86 ligand or a feline soluble CD86 ligand.
  3. An isolated nucleic acid encoding a feline CD28 receptor or a feline soluble CD28 receptor.
  4. An isolated nucleic acid encoding a feline CTLA-4 receptor or a feline soluble CTLA-4 receptor.
  5. The nucleic acid of claim 1, wherein the feline CD80 ligand has the sequence shown in Figure 1A beginning with methionine and ending with threonine (Sequence ID NO: 1).
  6. The nucleic acid of claim 2, wherein the feline CD86 ligand has the sequence shown in Figure 3A beginning with methionine and ending with isoleucine (Sequence ID NO: 5).
  7. The nucleic acid of claim 3, wherein the feline CD86 receptor shown in Figure 4A has the sequence beginning with methionine and ending with serine (Sequence ID NO: 7).
  8. The nucleic acid of claim 4, wherein the feline CTLA-4 receptor has the sequence shown in Figure 5A beginning with methionine and ending with asparagine (Sequence ID NO: 9).
  9. The nucleic acid of any of claim 1-4, wherein the nucleic acid is DNA or RNA.
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10. The nucleic acid of claim 9, wherein the DNA is cDNA or genomic DNA.
11. An oligonucleotide of at least 12 nucleotides which has a sequence complementary to a sequence uniquely present in the nucleic acid of any of claim 1-4.
12. The oligonucleotide of claim 11 which is at least 15 or 16 nucleotides in length.
13. The oligonucleotide of claim 11 or 12, wherein the oligonucleotide is detectably labeled.
14. The oligonucleotide of claim 13, wherein the detectable label comprises a radioisotope, a fluorophor, or biotin.
15. The oligonucleotide of claim 11 or 12, wherein the oligonucleotide is selectively methylated.
16. A vector comprising the nucleic acid of claim 1.
17. The plasmid vector of claim 16 designated PSI-B7-1/871-35 (ATCC Accession No. 209817).
18. A vector comprising the nucleic acid of claim 2.
19. The plasmid vector of claim 18 designated B7-2#19-2/011298 (ATCC Accession No. 209821).
20. A vector comprising the nucleic acid of claim 3.
21. The plasmid vector of claim 20 designated PSI-CD28 #7/100296 (ATCC Accession No. 209819).
22. A vector comprising the nucleic acid of claim 4.

23. The plasmid vector of claim 22 designated CTLA-4# 1/091997 (ATCC Accession No. 209820).
24. The vector of any of claim 16-23, comprising a promoter operably linked to the nucleic acid.
25. A host cell which comprises a vector of any of claim 16-24.
26. The host cell of claim 25, wherein the host cell is a eukaryotic or a prokaryotic cell.
27. The host cell of claim 26, wherein the host cell is selected from the group consisting of: E. Coli, yeast, COS cells, PC12 cells, CHO cells, and GH4C1 cells.
28. A polypeptide encoded by the nucleic acid of claim 1.
29. A polypeptide encoded by the nucleic acid of claim 2.
30. A polypeptide encoded by the nucleic acid of claim 3.
31. A polypeptide encoded by the nucleic acid of claim 4.
32. A method of producing the polypeptide of any of claim 28-31 which comprising culturing a host cell which expresses the polypeptide and recovering the polypeptide so produced.
33. A vaccine comprising an effective amount of a polypeptide of any of claim 28-30 and a suitable carrier.

34. A vaccine of claim 33, wherein the effective amount is an amount from about 0.01 mg to about 100mg per dose.
- 5 35. A vaccine of claim 33, wherein the effective amount is an amount from about 0.25 mg/kg weight body of a feline /day to about 25 mg/kg weight of a feline/day.
- 10 36. A vaccine of claim 33-35 which further comprises an immunogen derived from a pathogen.
37. A vaccine of claims 36, wherein the pathogen in a feline pathogen a rabies virus, chlamydia, Toxoplasmosis gondii, Dirofilaria immitis, a flea, or a bacterial pathogen.
- 15 38. A vaccine of claim 37 wherein the feline pathogen is feline immunodeficiency virus (FIV), feline leukemia virus (FeLV), feline infectious peritonitis virus (FIP), feline panleukopenia virus, feline calicivirus, feline reovirus type 3, feline rotavirus, feline coronavirus, feline syncytial virus, feline sarcoma virus, feline herpesvirus, feline Borna disease virus, or a feline parasite.
- 20 39. A method of inducing immunity in a feline which comprises administering to the feline a dose of a vaccine of any of claim 36-38.
- 30 40. A method of enhancing an immune response in a feline which comprises administering to the feline a dose of a vaccine of any of claim 33-38.
- 35 41. The method of claim 39 or 40 wherein the vaccine is administered subcutaneously, intramuscularly,

systemically, topically, or orally.

42. A method for suppressing an immune response in a feline which comprises administering to the feline an effective immune response suppressing amount of a polypeptide of claim 31.

43. A method for suppressing an immune response in a feline which comprises administering to the feline an effective immune response suppressing amount of a soluble polypeptide of claim 28-30.

44. A method of claim 42 or 43 wherein the amount is from about 0.25 mg/kg body weight/day to about 25 mg/kg body weight /day.

45. A method of claim 42 or 43 wherein the feline is suffering from an autoimmune disease or is the recipient of a tissue or organ transplant.

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